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Pine Shoot Beetle: Yet Another Threat To Mississippi Pine Forests

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The Pine Shoot Beetle (PSB), *Tomicus piniperda* L., is one of the worst native pests of pines in Europe. It can also be found in Africa, Asia and, as of 1992, the beetle was found in the United States. The native range of PSB coincides with latitudes as far south as Florida, so it should find most climates in North America suitable. Hosts of the PSB in Europe usually are Scotch pine (*Pinus sylvestris L.*), and occasionally spruce (*Abies* spp.) and larch (*Larix* spp.). Several pine species of the southeastern U.S. are considered susceptible to PSB, including sand pine (*Pinus clausa*), spruce pine, (*P. glabra)*, pond pine (*P. serotina*), and loblolly pine (*P. taeda*).

PSB is a dark brown beetle (Fig. 1) and its general appearance can be confused with other bark beetles such as the Southern Pine Beetle (SPB), Dendroctonus frontalis Zimmermann (Fig. 2). Adults are 1/8 to 1/4 inch long and larvae are approximately 1/4 inch long. PSB reproduces weakened, stressed, or recently dead trees. Adult PSB's overwinter beneath bark of pine trees, and emerge in March (or February in warm climates) and can fly up to 1.2 miles searching for suitable host material in which to lay eggs after mating occurs. The adults construct 10-25cm brood galleries under the bark in February or March where they lay their eggs. Female PSB die shortly after oviposition occurs. After hatching, the larvae chew through the phloem in galleries (Fig. 3) for a few months and emerge as new adults in late summer.

At this stage, the PSB adult needs to feed as a requirement to reach sexual maturation. The emerging adults (around May-October) will fly short distances in search of new shoots. One adult can attack up to 6 pine shoots during this stage and can tunnel as far as 10cm into each shoot (Fig. 4 & 5). The PSB has a 1 year life cycle in Canada and the northern U.S.A., but can have two generations per year in warmer climates.

Signs and symptoms of PSB include dieback, yellowing, and dead, bored-out shoots on trees or on the surrounding ground. Because PSB attacks the trunks and the shoots of pines during various stages of its lifecycle, damage may resemble that caused by Ips and/or southern pine beetles, as well as by pine tip moths (*Rhyacionia spp*.). Under certain circumstances, PSB can also kill trees (Fig. 6 & 7).

Because loblolly is potentially a suitable host for PSB, it represents a distinct and very real threat to Mississippi and could be very devastating to the southern region in general. As of 2012, the PSB has been detected in 19 states: Connecticut, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Virginia, Vermont, West Virginia, and Wisconsin. The PSB can spread naturally (flight dispersal) or through movement of nursery stock, Christmas trees, firewood, and other infested materials. Quarantine programs are established for the PSB (Fig. 8), and will hopefully limit the spread.

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Figure 2: Adult *Tomicus piniperda* (Linnaeus), pine shoot beetle. Photograph by: Gyorgy Csoka, Hungary Forest Research Institute, www.forestryimages.org

Figure 1: Pine Shoot Beetle (left) in comparison to a Southern Pine Beetle (right). Pine Shoot Beetle photo: © Christoph Benisch http://www.kerbtier.de/cgi-bin/enFSearch.cgi?Fam=Scolytidae Southern Pine Beetle photo: http://www.flbugs.com/southern-pine-beetle/

Figure 3: Pine Shoot Beetle Galleries. Photograph by: William M. Ciesla, Forest Health Management International, www.forestryimages.org

Figure 4: A circular (entrance or exit) hole in pine shoot caused by a pine shoot beetle. Photograph by: Gyorgy Csoka, Hungary Forest Research Institute, www.forestryimages.org

Figure 5: Shoot damage. (Steve Passoa, USDA APHIS PPQ, www.forestryimages.org)

Figure 6: Damage to pine tree by pine shoot beetle, showing infested tips. Photograph by: Robert A. Haack, USDA Forest Service, www.forestryimages.org

Figure 7: Close up of damage to pine tree by pine shoot beetle, showing infested tip. Photograph by: Bruce Smith, USDA AHPIS PPQ, www.forestryimages.org

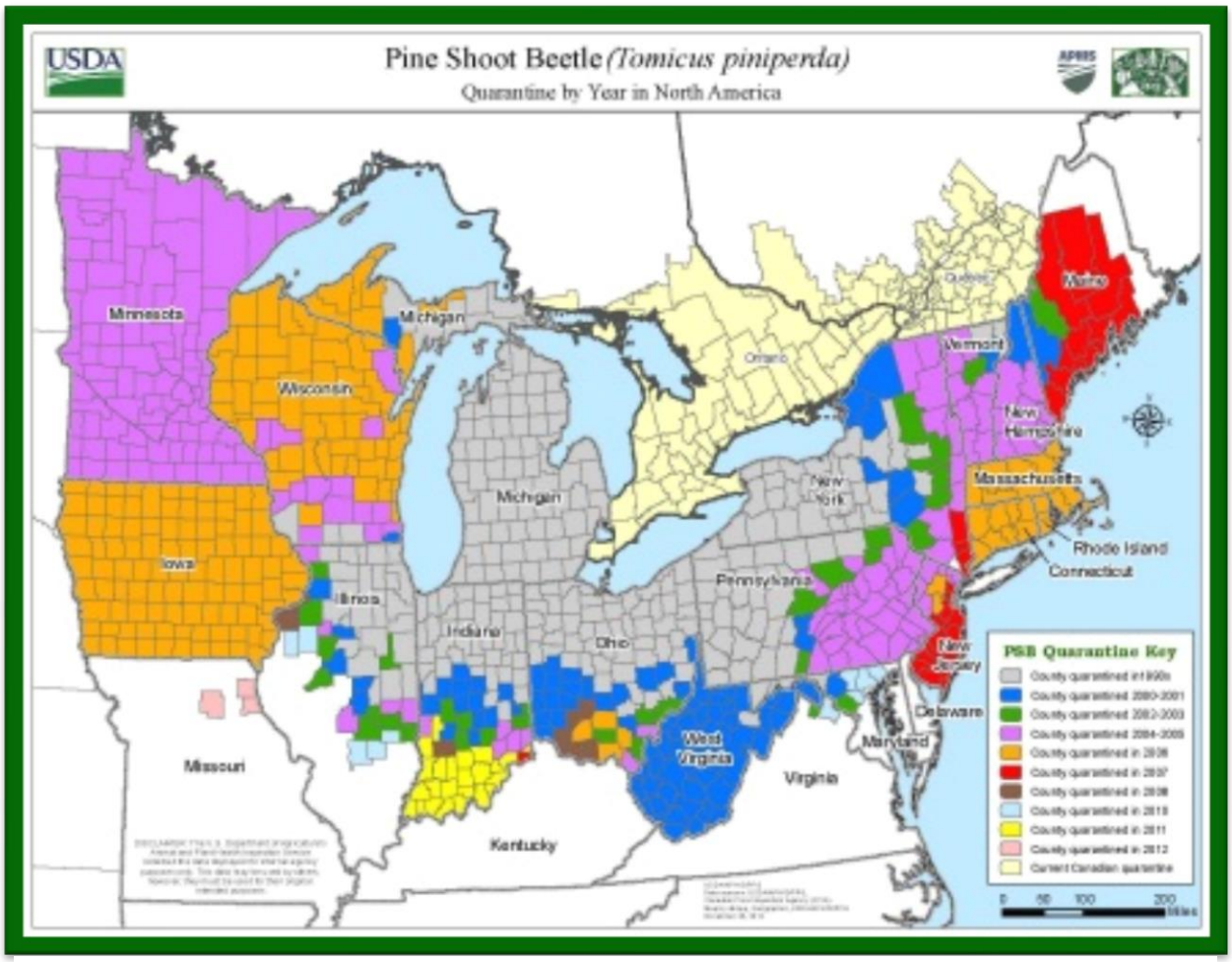

Figure 8: **Quarantine Map**
http://www.aphis.usda.gov/plant_health/plant_pest_info/psb/downloads/psbfirstoccurr.pdf USDA/APHIS/PPQ/, Data source: USDA/APHIS/PPQ, Canadian Food Inspector Agency (CFIA), Map by dbopp, Geographer, USDA/APHIS/PPQ, November 28, 2012